



LONG ISLAND LIGHTING COMPANY

SHOREHAM NUCLEAR POWER STATION

P.O. BOX 618, NORTH COUNTRY ROAD • WADING RIVER, N.Y. 11792

JOHN D. LEONARD, JR.
VICE PRESIDENT - NUCLEAR OPERATIONS

October 18, 1984

SNRC-1094

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

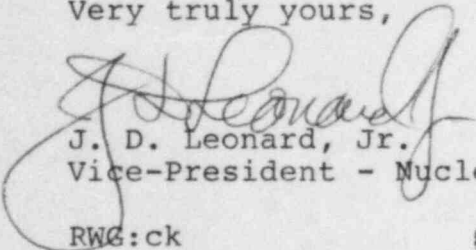
Confirmatory Testing of TDI Diesel Generators
Shoreham Nuclear Power Station - Unit 1
Docket No. 50-322

Dear Mr. Denton:

As you know, LILCO has committed to do certain confirmatory testing of one of Shoreham's TDI diesels. The Staff concerns focus on the engine crankshaft and the cam gallery areas of the engine block. Extensive discussions between our staffs and consultants resulted in agreement on various aspects of the testing and associated post-test inspections and the attached document sets forth the testing protocol which has been agreed to. As you can see, this document includes detailed information concerning test duration, test instrumentation, strain gauges, post-test inspections and acceptance criteria. LILCO is currently conducting the confirmatory test at the qualified load of 3300 kw. The basis for the selection of this qualified load will be provided in an FSAR amendment to be submitted in the very near future.

I am confident that LILCO and the NRC can continue to work together to resolve any remaining concerns and that this confirmatory test will provide a mutually acceptable basis for finding these diesels reliable for their intended service.

Very truly yours,


J. D. Leonard, Jr.
Vice-President - Nuclear Operations

RWG:ck

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Enclosure

cc: P. Eselgroth
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All Parties Listed in Attachment 1

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ATTACHMENT I

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Exhibit A

Shoreham Nuclear Power Station
Confirmatory Testing Protocol

Test Engine: EDG 103 will be tested.

Test Duration: The test duration will be for seven hundred and forty hours total, with credit to be given for all hours accumulated at the test load identified below, since the installation of the replacement crankshaft. Two hundred and nineteen hours (219) have been accumulated at or above the test load since the installation of the replacement crankshaft. Therefore, 521 hours of operation at the test load remain for completion of the test. These 521 hours need not be the result of continuous operation. It is understood and contemplated that shutdowns during the 521 hours of operation may occur for a variety of reasons including routine maintenance and surveillance tests. Such shutdowns shall not affect the validity of the tests with respect to the crankshaft and block unless the shutdown is occasioned by a failure of that particular component.

Test Load: The test will be conducted at a load of 3300 kw (qualified load) as measured using normal plant instrumentation (i.e. ± 100 kw) which according to LILCO's letter dated September 11, 1984, (SNRC-1077) from J. D. Leonard to H. R. Denton, exceeds the maximum emergency service load requirements for Shoreham. No specific KVAR loading is required. The basis for this reduced load requirement will be formally submitted to the NRC for its review and approval via an amended Section 8.3.1 of the FSAR.

Test Instrumentation: Normal control room instrumentation will be used to verify the load, and the load output in kilowatts will be logged every 30 minutes. Peak firing pressure will be measured by a Kiene gauge at the start and end of the remaining 521 hour test run.

Strain Gauge Measurements: Strain gauge measurements will be taken at two locations within the cam gallery area. Strain gauges will be installed near the cam saddle inward of the number 1 and number 8 cylinders and data will be recorded during an engine heatup to standby temperature, at several steady state operating levels, and during the performance of an engine start and loading. The two saddle areas in the cam gallery where the strain gauges are to be installed will be inspected by the magnetic particle or liquid penetrant technique prior to the installation of the strain gauges.

Pre-Test Inspections: Pre-test inspections will be at the discretion of LILCO. It is understood that the NRC staff will consider any indications found during post-test inspections to be new indications occurring as a result of the engine test unless LILCO has direct inspection evidence that the indications were present prior to the test.

Post Test Inspections

(i) Engine Block:

- (1) Liquid penetrant (LP), and eddy current (EC), as appropriate, will be performed on the complete top of the cylinder block and in the cam gallery in the two locations of strain gauges.
- (2) If LP inspections above indicate crack indications between stud holes of adjacent cylinders then all studs on all affected cylinders will be removed and EC inspections of the stud holes will be performed. Otherwise, only the four stud holes between cylinders 4 and 5 will be inspected by EC.

(ii) All connecting rod bearings will be subjected to liquid penetrant inspection.

(iii) All wrist pin and wrist pin bushings will be subjected to liquid penetrant inspections.

(iv) Turbocharger:

- (1) Visual inspections will be performed of the nozzle ring vanes and capscrews and the turbocharger mounting flange bolts.

(v) Crankshaft:

Liquid penetrant and eddy current testing, as appropriate, will be performed on all fillet areas and on all oil holes of the crankshaft except at main bearings 1 and 2, and 10 and 11.

(vi) Front end gears and gear teeth as accessible will receive a complete visual inspection for excessive wear or other distress.

(vii) Visual examination of cylinder liners will be performed for excessive scuffing with deglazing to be performed where appropriate.

(viii) Liquid penetrant inspection will be performed for all stud boss areas of all of the AE pistons. Eddy current inspections will be conducted to investigate any indications found by liquid penetrant inspection. A visual inspection of crown to skirt contact surfaces will be performed to determine if excessive fretting has occurred.

Inspection Acceptance Criteria: LILCO will use the acceptance criteria based upon the TDI Owners Group acceptance criteria. In cases where these criteria have not been explicitly stated in Owners Group reports or in the Component Revalidation checklist submitted as part of the Shoreham DRQR package (e.g., engine block, pistons), LILCO will identify its quantitative criteria for evaluating indications as being acceptable and/or relevant, and provide the technical basis for these criteria.

Post-Inspection Testing: Following engine reassembly, "hot" and "cold" crankshaft deflection measurements shall be taken to verify that the crankshaft alignment is within manufacturer's recommendations. To the extent not already included as part of the manufacturers recommendations or plant Technical Specification requirements, the following engine tests shall be performed to demonstrate operability of the engine:

- Ten modified starts to at least 1400 kw, but not to exceed 3300 kw
- Two fast starts to 3300 kw
- One 16 hour test at load levels stepping up to and then down from 3300 kw. This should include a total of four hours at each of the following loads: 3300kw, 2625 kw, 1750 kw and 875 kw.

A modified start is defined as a start including a prelube period as recommended by the manufacturer and a 3 to 5 minute loading to the specified load level, with operation at the level for a minimum of one hour. A fast start is one conducted from the control room on simulation of an Engineered Safety Feature (ESF) signal with the engine on ready standby basis. The engine should be run for four hours for each fast start test. The 16 hour run is recommended to detect abnormal temperatures, pressures and/or temperature excursions that might indicate abnormal engine behavior. Either a modified or a fast start may be utilized.

Reporting Requirements: A test/inspection report will be submitted for NRC staff evaluation. Abnormalities observed during the engine test, and any corrective actions will be discussed. The report will also address all relevant indications and other unusual findings during the post-test inspection. The engineering disposition of all indications will be discussed and repairs/replacements identified and justified.

The above reporting requirements notwithstanding, any significant problems encountered, either during testing or inspection, will be immediately reported to the NRC staff in order to permit a timely evaluation by the staff regarding their significance and the adequacy of remedial actions by LILCO.